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EXAMINER	
HOLMES, MICHAEL B	
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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/876,929	Applicant(s) PIRIM, PATRICK	
	Examiner Michael B. Holmes	Art Unit 2121	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 June 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *19-22* is/are allowed.

6)☒ Claim(s) *1,3-6,10-18 and 23* is/are rejected.

7)☒ Claim(s) *2 and 7-9* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *31 December 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☒ None of:

1.☐ Certified copies of the priority documents have been received.

2.☒ Certified copies of the priority documents have been received in Application No. 09/876,929.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *6,7*.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

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Examiner's Detailed Office Action

1. This office action is responsive to application **09/876,929,** filed **June 08, 2001**.

2. **Claims 1-23** have been examined.

Information Disclosure Statement

3. Examiner acknowledges applicants' submission of prior art and information disclosure. Nevertheless, applicant is respectfully remind of the ongoing Duty to disclose 37 C.F.R. 1.56 all pertinent information and material pertaining to the patentability of applicant's claimed invention, by continuing to submitting in a timely manner PTO-1449, Information Disclosure Statement (IDS) with the filing of applicant's of application or thereafter.

Drawings

4. The formal drawings have been reviewed by the United States Patent & Trademark Office of Draftperson's Patent Drawings Review.

Specification

5. The specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is required in correcting any errors of which applicant may become aware in the specification.

Claim Objection

6. **Claim 2, 7-9** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim Interpretation

7. Office personnel are to give claims their **"broadest reasonable interpretation"** in light of the supporting disclosure. *In re Morris*, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027-28 (Fed. Cir. 1997). Limitations appearing in the specification but not recited in the claim are not read into the claim. *In re Prater*, 415 F.2d 1393, 1404-05, 162 USPQ 541, 550-551(CCPA 1969). See *also *In re Zletz*, 893 F.2d 319, 321-22, 13 USPQ2d 1320, 1322(Fed. Cir. 1989) ("During patent examination the pending claims must be interpreted as broadly as their terms reasonably allow. . . . The reason is simply that during patent prosecution when claims can be amended, ambiguities should be recognized, scope and breadth of language explored, and clarification imposed. . . . An essential purpose of patent examination is to fashion claims that are

precise, clear, correct, and unambiguous. Only in this way can uncertainties of claim scope be removed, as much as possible, during the administrative process."). *see* MPEP § 2106

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. **Claims 1, 3-6, 12-16, & 23** are rejected under 35 U.S.C. 102(b) as being anticipated by **Hashimoto et al. (USPN 5,625,717), Filed: Jun. 22, 1993; Date of Patent: Apr. 29, 1997.**

Regarding claim 1:

Hashimoto et al. teaches,

A method for localization of a shape in a space represented by pixel data forming a multidimensional space i, j, evolving with time, and represented at a succession of instants T, wherein the data is associated with a plurality of parameters {A, B, ...} in the form of digital signals {DATA(A), DATA(B),...} composed of a sequence {Aijt, Bijt, ...} of binary numbers of n bits associated with synchronization signals defining the instants T of the space and the position i, j in the space, at which the signals {Aijt, Bijt,...} are received, the method comprising:

a) receiving the pixel data; **[FIG. 34; (col. 2, lines 08-19** "*FIG. 34 is a flowchart showing the*

regional segmentation procedure followed by the conventional regional segmentation device of FIG. 33. It is assumed that when the procedure starts at step S2151, the object image is stored beforehand in the original image storage 2141. At step S2152, the grey level histogram generator 2142 generates grey level histogram of the original image. FIG. 35 shows an exemplary grey level histogram generated by the grey level histogram generator in the procedure of FIG. 34. The grey level histogram is the plot of the frequency of the grey levels (plotted along the ordinate in FIG. 35) at respective **pixels** *of the image (plotted along the abscissa in FIG. 35). At step S2153, the threshold level determiner 2143 determines the threshold level on the basis of the grey level histogram obtained at step S2152. If the histogram exhibits two distinct maxima or hills as shown in FIG. 35, the threshold level is set at the minimum (trough) between the two maxima.*")]

b) identifying a main region of interest of the space based on a statistic criterion applied to one of said parameters, the identified region having a center of gravity; **[FIG. 45; (col. 5, lines 34-61** "*FIG. 45 is a diagram schematically representing the characteristic space memory 4075 of the image processing device of FIG. 43. In the example shown in FIG. 45, two kinds of characteristics: "the area of the region (X1)" and "the likeness of the region to the circle (X2)" are used. Both of these two characteristic values are represented by scalar quantities. For each region, the pair of the area X1 of the region and the likeness to the circle X2 are calculated. Thus, the (two-dimensional vector) characteristic value of the object 4072 can be plotted on the two-dimensional characteristic space as shown in FIG. 45. When three or more characteristics are used, the characteristic space having a dimension equal to the number of the characteristics is to be used. Moving the position of the object 4072 successively, or replacing it with another,*

the steps S4081 through S4083 are repeated, such that a multitude of points are plotted in the characteristic space memory 4075. Generally, these points are divided into several clusters. At step S4084, the clusters are extracted from the characteristic space. For example, in the case of the example shown in FIG. 45, the multitude of points form three clusters of points. The three clusters are named class 1, 2 and 3, respectively. At step S4085, representative points of the respective classes 1, 2 and 3 are extracted. In the case of the example shown in FIG. 45, the classes 1, 2 and 3 are represented by the respective centers of gravity C1, C2 and C3 thereof, which are the class representative values 4076. The above procedure constitutes the preparatory stage.")]

c) repeating step b) using the pixel data associated with the main region of interest so as to identify one or more other regions inside the main region; **[FIG. 34; (col. 2, lines 08-19 "***FIG. 34 is a flowchart showing the regional segmentation procedure followed by the conventional regional segmentation device of FIG. 33. It is assumed that when the procedure starts at step S2151, the object image is stored beforehand in the original image storage 2141. At step S2152, the grey level histogram generator 2142 generates grey level histogram of the original image. FIG. 35 shows an exemplary grey level histogram generated by the grey level histogram generator in the procedure of FIG. 34. The grey level histogram is the plot of the frequency of the grey levels (plotted along the ordinate in FIG. 35) at respective* ***pixels*** *of the image (plotted along the abscissa in FIG. 35). At step S2153, the threshold level determiner 2143 determines the threshold level on the basis of the grey level histogram obtained at step S2152. If the histogram exhibits two distinct maxima or hills as shown in FIG. 35, the threshold level is set at the minimum (trough) between the two maxima.***")]**

d) for each identified region of interest, incrementing a counter for each consecutive valid frame; **[(col. 28, line 50 to col. 29, line 12 "***FIG. 24 is a block diagram showing the structure of an image processing device according to a sixth embodiment of this invention. FIG. 25 is a flowchart showing the procedure followed by the image processing device according to the sixth embodiment. The operation of the image processing device is described by reference to FIGS. 24 and 25. According to the sixth embodiment, n successive frames of images, referred to as the first through n'th frame, are processed, wherein n may be from about 10 to 20. The successive image frames are taken and input at a predetermined interval of 33 milliseconds. The parallax is calculated from the first and the n'th frames. Thus, the three-dimensional depths of objects depicted in the image may be calculated on the basis of the principle of the steroscopic vision. First at step S3082 after the start at step S3081, the value k of the internal counter is set at one (k=1). It is noted that the value k is incremented by one (k=k+1) as described below each time the steps S3083 through 3088 are performed. Next at step S3083, the image Fk of the k'th frame is input by means of the image input means and stored in the respective original image F1 memory. At the first execution cycle where k=1, the image F1 of the first frame is input and stored. The image F1 of the first frame is stored in the original image F1 memory 3071A. The image F2 of the second frame is stored in the original image F2 memory 3071B. The image F3 of the third frame is stored in the original image F3 memory 3071C. Further, the image Fn of the n'th frame is stored in the original image Fn memory 3071D.*"**)]** and

e) recording the center of gravity of each identified region of interest for each valid frame. **[(col. 29, line 64 to col. 30, line 24 "***FIG. 26a shows successive image frames with labeled regions and the centers of gravity thereof. In FIG. 26a, a 0-level region in the successive image*

frames F1 3091, F2 3092, F3 3093,- - - , Fn 3094 is labeled with L1 3095, L2 3096, L3 3097, - - , Ln 3098. As noted above by reference to FIGS. 4c in the description of the first embodiment, 0-level regions of the tri-level image generally represent regions of the original image within which the variation of the grey level is small. At step S3087, the label positions of the respective labeled regions of the output of the labeling means are detected by the label position detector means. At the first execution cycle where k=1, the label positions of the respective labeled regions of the output of the labeling means 3074A are detected by the label position detector means 3075A. At the second execution cycle where k=2,. the label positions of the respective labeled regions of the output of the labeling means 3074B are detected by the label position detector means 3075B. At the third execution cycle where k=3, the label positions of the respective labeled regions of the output of the labeling means 3074C are detected by the label position detector means 3075C. At the n'th execution cycle where k=n, the label positions of the respective labeled regions of the output of the labeling means 3074D are detected by the label position detector means 3075D. In the case of this embodiment, the label position of a labeled region is the center of gravity of the region. In FIG. 26a, the centers of gravity of the labels L1 3095, L2 3096, L3 3097, Ln 3098 are represented by the points G1 3099, G2 309A, G3 309B, Gn 309C, respectively.“)]

Regarding claim 3:

Hashimoto et al. teaches,

The method of claim 1, wherein the position of the center of gravity of the points defining a region of interest is stored in a memory. **[(col. 30, line 26-43** “*Next at step S3088, the label*

correspondence calculator means 3077 determines the relationship between the label positions of corresponding labeled regions of each two successive image frames. For example, in the second execution cycle where k=2, the center of gravity G2 309A of the labeled region L2 3096 of the second frame F2 is positioned closest to the center of gravity G1 3099 of the labeled region L1 3095 of the first frame F1. Thus, the correspondence between the two label positions G1 and G2 is established, and the correspondence therebetween is stored in a memory. The method of determination of the correspondence of the label positions of two successive frames is similar to that of the fifth embodiment described above. In FIG. 26a, the correspondence among the centers of gravity G1 3099, G2 309A, G3 309B, Gn 309C, of the labels L1 3095, L2 3096, L3 3097, Ln 3098, are successively established by the label correspondence calculator means 3077 as the value k is incremented from one to n.")]

Regarding claim 4:

Hashimoto et al. teaches,

The method of claim 1, wherein each region of interest is validated for one value of its associated counter that is greater than 1. **[(col. 30, line 26-43** "*Next at step S3088, the label correspondence calculator means 3077 determines the relationship between the label positions of corresponding labeled regions of each two successive image frames. For example, in the second execution cycle where k=2, the center of gravity G2 309A of the labeled region L2 3096 of the second frame F2 is positioned closest to the center of gravity G1 3099 of the labeled region L1 3095 of the first frame F1. Thus, the correspondence between the two label positions G1 and G2 is established, and the correspondence therebetween is stored in a memory. The method of determination of the*

correspondence of the label positions of two successive frames is similar to that of the fifth embodiment described above. In FIG. 26a, the correspondence among the centers of gravity G1 3099, G2 309A, G3 309B, Gn 309C, of the labels L1 3095, L2 3096, L3 3097, Ln 3098, are successively established by the label correspondence calculator means 3077 as the value k is incremented from one to n.")]

Regarding claim 5:

Hashimoto et al. teaches,

The method of claim 4, wherein the validated region is identified by its center of gravity, the orientation of its projection axes and the sizes of the associated frame. **[(col. 31, lines 01-20** "*Finally at step S308F, on the basis of the outputs of the contour extractor means 3076A for the first frame and the contour extractor means 3076D for the n'th frame, and the output of the label correspondence calculator means 3077, the parallax calculator means 3078 calculates the parallax between the moving object in the first and the n'th image frames F1 and Fn. As described above, the correspondence among the centers of gravity G1 3099, G2 309A, G3 309B, Gn 309C, of the labels L1 3095, L2 3096, L3 3097, Ln 3098 are successively established by the label correspondence calculator means 3077. Further, the contour extractor means 3076A and 3076D generate the contour images 309D (FIG. 26b) and 309E (FIG. 26c), respectively. Based on the information supplied by the contour extractor means 3076A, 3076D and label correspondence calculator means 3077, the parallax calculator means 3078 establishes correspondence between the contours of the images 309D and 309E. It is assumed that the correspondence is thus established between the contour 309F of the image 309D (FIG. 26b) and*

the contour 309G of the image 309E (FIG. 26c).")]

Regarding claim 6:

Hashimoto et al. teaches,

The method of claim 5, wherein the center of gravity, the main axes of the frame and the size of the frame, are respectively the position, the orientation and the size of the object perceived. **[(col. 31, lines 21-26** "*Further, the parallax calculator means 3078 detects the corner points P1, Q1, R1, and S1 of the contour 309F (FIG. 26b) and Pn, Qn, Rn, and Sn of the contour 309G (FIG. 26c), and determines that P1, Q1, R1, and S1 of the contour 309F correspond to Pn, Qn, Rn, and Sn of the contour 309G, respectively.*")]

Regarding claim 12:

Hashimoto et al. teaches,

The method of claim 1, wherein the parameter is a color. **[(col. 8, lines 24-37** "*Furthermore, with respect to the method of the division of regions, the image is divided into regions using characteristic values such as the brightness and the color, upon the assumption that most of the pixels upon a surface exhibit similar characteristic values. However, in the case where the color information can not be used due to the restriction upon the size of the device,. the brightness information (the grey level information) of each pixel is the most important characteristic value available. Thus, if the brightness changes within the surface or if there are variations in the intensity of illumination, the division into regions cannot be effected reliably. As a result, the recognition of the objects becomes difficult.*")]

Regarding claim 13:

Hashimoto et al. teaches,

The method of claim 1, wherein the parameter is spatial resolution. **[(col. 8, lines 64 to col. 9, line 15** "*A further secondary object of this invention is to provide an image processing device for recognizing objects which is free from the above mentioned disadvantages of the conventional image processing device. The above primary object is accomplished in accordance with the principle of this invention by an image processing device which comprises: original image input means for inputting a grey level image of an object; spatial band-pass filter means, coupled to the original image input means, for applying a spatial band-pass filter upon the grey level image of the object, thereby generating a filtered image of the object; and tri-level thresholding means, coupled to the spatial band-pass filter means, for thresholding the filtered reference pattern and the filtered image of the object at two distinct threshold levels, thereby generating tri-level image of the object.*"**)]**

Regarding claim 14:

Hashimoto et al. teaches,

The method of claim 1, wherein the parameter is field depth. **[(col. 28, line 50-68** "*FIG. 24 is a block diagram showing the structure of an image processing device according to a sixth embodiment of this invention. FIG. 25 is a flowchart showing the procedure followed by the image processing device according to the sixth embodiment. The operation of the image processing device is described by reference to FIGS. 24 and 25. According to the sixth embodiment, n successive frames of images, referred to as the first through n'th frame, are*

processed, wherein n may be from about 10 to 20. The successive image frames are taken and input at a predetermined interval of 33 milliseconds. The parallax is calculated from the first and the n'th frames. Thus, the three-dimensional depths of objects depicted in the image may be calculated on the basis of the principle of the steroscopic vision.")]

Regarding claim 15:

Hashimoto et al. teaches,

The method of claim 1, wherein the registered region is defined with respect to a mark selected among several marks of different orientations. [**Abstract** ("*An image processing device includes: a DOG filtering means for applying a DOG filter upon the grey level image of an object; and a tri-level thresholding means for thresholding the output of the DOG filtering means at two distinct threshold levels, thereby obtaining a tri-level image of the object. The 0-level regions of the tri-level image correspond to regions of the original image, such as the surface areas of the object, within which the variation of the grey level is small. The boundary between two 0-regions is marked by adjacent parallel strips of a (+)-region and a (-)-region, wherein the zero-crossing line between the (+)-region and the (-)-region clearly defines the contour line of the 0-regions. This method of tri-level quantization provides a basis for efficient template matching of the images of objects, recognition or identification of objects, the detection of movement vectors of objects, and the detection of the parallax of a continuously moving objects.*")]

Regarding claim 16:

Hashimoto et al. teaches,

The method of claim 1, wherein the relative positions of the centers of gravity of the regions of interest registered serve for controlling the shape of an object perceived. **[("***FIG. 26a shows successive image frames with labeled regions and the centers of gravity thereof.***")]**

Regarding claim 23:

Hashimoto et al. teaches,

A method for localization of a shape in a space represented by pixel data forming a multidimensional space i, j, evolving with time, and represented at a succession of instants T, wherein the data is associated with a plurality of parameters {A, B,...} in the form of digital signals {DATA(A), DATA(B),...} composed of a sequence {Aijt, Bijt,...} of binary numbers of n bits associated with synchronization signals defining the instants T of the space and the position i, j in the space, at which the signals {Aijt, Bijt,...} are received, the method comprising:

a) receiving the pixel data; **[FIG. 34; (col. 2, lines 08-19 "***FIG. 34 is a flowchart showing the regional segmentation procedure followed by the conventional regional segmentation device of FIG. 33. It is assumed that when the procedure starts at step S2151, the object <u>image</u> is stored beforehand in the original <u>image</u> storage 2141. At step S2152, the grey level <u>histogram</u> generator 2142 generates grey level <u>histogram</u> of the original <u>image</u>. FIG. 35 shows an exemplary grey level <u>histogram</u> generated by the grey level <u>histogram</u> generator in the procedure of FIG. 34. The grey level <u>histogram</u> is the plot of the frequency of the grey levels*

(plotted along the ordinate in FIG. 35) at respective **pixels** *of the* <u>*image*</u> *(plotted along the abscissa in FIG. 35). At step S2153, the threshold level determiner 2143 determines the threshold level on the basis of the grey level* <u>*histogram*</u> *obtained at step S2152. If the* <u>*histogram*</u> *exhibits two distinct maxima or hills as shown in FIG. 35, the threshold level is set at the minimum (trough) between the two maxima.*“)]

b) identifying a region of interest of the space based on a statistic criterion applied to one of said parameters, the region of interest having a center of gravity; **[FIG. 45; (col. 5, lines 34-61** “*FIG. 45 is a diagram schematically representing the characteristic space memory 4075 of the* <u>*image*</u> *processing device of FIG. 43. In the example shown in FIG. 45, two kinds of characteristics: "the area of the region (X1)" and "the likeness of the region to the circle (X2)" are used. Both of these two characteristic values are represented by scalar quantities. For each region, the pair of the area X1 of the region and the likeness to the circle X2 are* <u>*calculated*</u>*. Thus, the (two-dimensional vector) characteristic value of the object 4072 can be plotted on the two-dimensional characteristic space as shown in FIG. 45. When three or more characteristics are used, the characteristic space having a dimension equal to the number of the characteristics is to be used. Moving the position of the object 4072 successively, or replacing it with another, the steps S4081 through S4083 are repeated, such that a multitude of points are plotted in the characteristic space memory 4075. Generally, these points are divided into several clusters.*

At step S4084, the clusters are extracted from the characteristic space. For example, in the case of the example shown in FIG. 45, the multitude of points form three clusters of points. The three clusters are named class 1, 2 and 3, respectively. At step S4085, representative points of the respective classes 1, 2 and 3 are extracted. In the case of the example shown in FIG. 45, the

classes 1, 2 and 3 are represented by the respective centers of gravity C1, C2 and C3 thereof, which are the class representative values 4076. The above procedure constitutes the preparatory stage.")]

c) repeating step b) one or more times using the pixel data not associated with a previously identified region of interest so as to identify one or more other regions of interest; **[FIG. 34; (col. 2, lines 08-19** "*FIG. 34 is a flowchart showing the regional segmentation procedure followed by the conventional regional segmentation device of FIG. 33. It is assumed that when the procedure starts at step S2151, the object image is stored beforehand in the original image storage 2141. At step S2152, the grey level histogram generator 2142 generates grey level histogram of the original image. FIG. 35 shows an exemplary grey level histogram generated by the grey level histogram generator in the procedure of FIG. 34. The grey level histogram is the plot of the frequency of the grey levels (plotted along the ordinate in FIG. 35) at respective* ***pixels*** *of the image (plotted along the abscissa in FIG. 35). At step S2153, the threshold level determiner 2143 determines the threshold level on the basis of the grey level histogram obtained at step S2152. If the histogram exhibits two distinct maxima or hills as shown in FIG. 35, the threshold level is set at the minimum (trough) between the two maxima.*")]

d) for each identified region of interest, incrementing a counter for each consecutive valid frame; **[(col. 28, line 50 to col. 29, line 12** "*FIG. 24 is a block diagram showing the structure of an image processing device according to a sixth embodiment of this invention. FIG. 25 is a flowchart showing the procedure followed by the image processing device according to the sixth embodiment. The operation of the image processing device is described by reference to FIGS. 24 and 25. According to the sixth embodiment, n successive frames of images, referred to as the first*

through n'th frame, are processed, wherein n may be from about 10 to 20. The successive image frames are taken and input at a predetermined interval of 33 milliseconds. The parallax is calculated from the first and the n'th frames. Thus, the three-dimensional depths of objects depicted in the image may be calculated on the basis of the principle of the steroscopic vision. First at step S3082 after the start at step S3081, the value k of the internal counter is set at one (k=1). It is noted that the value k is incremented by one (k=k+1) as described below each time the steps S3083 through 3088 are performed. Next at step S3083, the image Fk of the k'th frame is input by means of the image input means and stored in the respective original image F1 memory. At the first execution cycle where k=1, the image F1 of the first frame is input and stored. The image F1 of the first frame is stored in the original image F1 memory 3071A. The image F2 of the second frame is stored in the original image F2 memory 3071B. The image F3 of the third frame is stored in the original image F3 memory 3071C. Further, the image Fn of the n'th frame is stored in the original image Fn memory 3071D.")] and

e) recording the center of gravity of each identified region of interest for each valid frame.

[(col. 29, line 64 to col. 30, line 24 "*FIG. 26a shows successive image frames with labeled regions and the centers of gravity thereof. In FIG. 26a, a 0-level region in the successive image frames F1 3091, F2 3092, F3 3093,- - -, Fn 3094 is labeled with L1 3095, L2 3096, L3 3097, - - -, Ln 3098. As noted above by reference to FIGS. 4c in the description of the first embodiment, 0-level regions of the tri-level image generally represent regions of the original image within which the variation of the grey level is small. At step S3087, the label positions of the respective labeled regions of the output of the labeling means are detected by the label position detector means. At the first execution cycle where k=1, the label positions of the respective labeled*

regions of the output of the labeling means 3074A are detected by the label position detector means 3075A. At the second execution cycle where k=2, the label positions of the respective labeled regions of the output of the labeling means 3074B are detected by the label position detector means 3075B. At the third execution cycle where k=3, the label positions of the respective labeled regions of the output of the labeling means 3074C are detected by the label position detector means 3075C. At the n'th execution cycle where k=n, the label positions of the respective labeled regions of the output of the labeling means 3074D are detected by the label position detector means 3075D. In the case of this embodiment, the label position of a labeled region is the center of gravity of the region. In FIG. 26a, the centers of gravity of the labels L1 3095, L2 3096, L3 3097, Ln 3098 are represented by the points G1 3099, G2 309A, G3 309B, Gn 309C, respectively.")]

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

11. **Claims 10-11** are rejected under 35 U.S.C. 103(a) as being unpatentable over

Hashimoto et al. (USPN 5,625,717),

in view of

Yasui et al. (USPN 6,091,833).

The *Hashimoto et al.* reference has been discussed above, and does not explicitly teach the limitations of claims 10 & 11. However, *Yasui et al.* teaches the limitations of claims 10 & 11.

Regarding claim 10:

Yasui et al. teaches,

The method of claim 1, wherein the parameter is velocity. **[(col. 5, lines 31-39 "***As shown in FIG. 1, the local positioning apparatus LP comprises a digital imaging apparatus 100, spatial frequency separator 200, lane area detector 300, lane contour detector 40a, lane detector 500, and electronic control unit (ECU) 700. Note that the ECU 700 is a device commonly used and known in the automobile industry, and is used to detect the vehicle condition as represented by the speed of travel and steering condition, generate a vehicle condition signal Sc, which includes a* <u>*velocity*</u> *signal Sv and steering signal Ss, and controls the various electrical devices of the vehicle.***")]** It would have been obvious at the time the invention was made to a person having

ordinary skill in the art to which said subject matters pertains, to employ the methods of obtaining 2 frames of the image sequence, matching each small region within the frames, and measuring the motion of the velocity component of a target included in the small region, e.g., the methods use the images of 2 different frames of the image sequence. First, a best matching position where a certain region normally, a square region within the image of one frame best matches the image of the other frame is searched. Next, the moving velocity of the object within the target region is estimated from a displacement between the 2 frames and the frame interval of the 2 frames. A cross-correlation coefficient of the image gray level value is used to describe the degree of matching of the 2 image regions.

Regarding claim 11:

Yasui et al. teaches,

The method of claim 1, wherein the parameter is a luminance level. **[(“***FIG. 12 is a graph of the relationship between pixel luminance in the luminance image in FIG. 11 and the pixel count having a particular luminance value.***“)]** It would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matters pertains, to employ, a cylindrical motion trajectory which is generated, and the edge and the contour within the image can be represented as a base curve of a cylinder. The magnitude of the gray level value of the spatio-temporal difference image D(x, y, t) is approximately proportional to the motion quantity and the magnitude of the discontinuity seen in the spatial distribution of the luminance of the edge and the contour within the image i.e., any method capable of extracting the motion trajectory as the three-dimensional volume data may be used while using the spatio-temporal

difference image.

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

13. **Claims 17-18** are rejected under 35 U.S.C. 103(a) as being unpatentable over

Hashimoto et al. (USPN 5,625,717),

in view of

Andi (USPN 5,008,946).

The *Hashimoto et al.* reference has been discussed above, and does not explicitly teach the limitations of claims 17 & 18. However, *Ando* teaches the limitations of claims 17 & 18.

Regarding claim 17:

Ando teaches,

The method of claim 1, wherein the shape is a human face. **[("FIG. 13a-FIG. 13d")]** It would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matters pertains, to employ histogram calculation for the purpose of image detection e.g., detecting information on an area of a human face and so on, of which are capable of suppressing incorrect detection with a small calculation amount, even when there are changes

in expression of the face including motions of an eye and mouth, and are variations in the face due to the presence or absence of e.g., a mustache and so on.

Regarding claim 18:

Ando teaches,

The method of claim 17, wherein the main region is the face and secondary regions are selected from one or more of the eyes, the mouth, the eyebrows and the nose. **[("FIG. 13a-FIG. 13d")]**It would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matters pertains, to employ histogram calculation for the purpose of image detection e.g., detecting information on an area of a human face and so on, of which are capable of suppressing incorrect detection with a small calculation amount, even when there are changes in expression of the face including motions of an eye and mouth, and are variations in the face due to the presence or absence of e.g., a mustache and so on.

Allowable Subject Matter

14. **Claims 19-22 are allowed.**

Conclusion

15. The prior art made of record and (listed of form **PTO-892**) not relied upon is considered pertinent to applicant's disclosure as follows. Applicant or applicant's representative is respect-

fully reminded that in process of patent prosecution i.e., amending of claims in response to a rejection of claims set forth by the Examiner per Title 35 U.S.C. The patentable novelty must be clearly shown in view of the state of the art disclosed by the references cited and any objections made. Moreover, applicant or applicant's representative must clearly show how the amendments avoid or overcome such references and objections. *See* **37 CFR § 1.111(c)**.

Correspondence Information

16. Any inquiries concerning this communication or earlier communications from the examiner should be directed to **Michael B. Holmes** who may be reached via telephone at **(703) 308-6280**. The examiner can normally be reached Monday through Friday between 8:00 a.m. and 5:00 p.m. eastern standard time.

If you need to send the Examiner, a facsimile transmission regarding After Final issues, please send it to **(703) 746-7238**. If you need to send an Official facsimile transmission, please send it to **(703) 746-7239**. If you would like to send a Non-Official (draft) facsimile transmission the fax is **(703) 746-7240**. If attempts to reach the examiner by telephone are unsuccessful, the **Examiner's Supervisor**, **Anthony Knight**, may be reached at **(703) 308-3179**.

Any response to this office action should be mailed too:

Director of Patents and Trademarks Washington, D.C. 20231. Hand-delivered responses should be delivered to the Receptionist, located on the fourth floor of **Crystal Park II, 2121 Crystal Drive Arlington, Virginia.**

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